



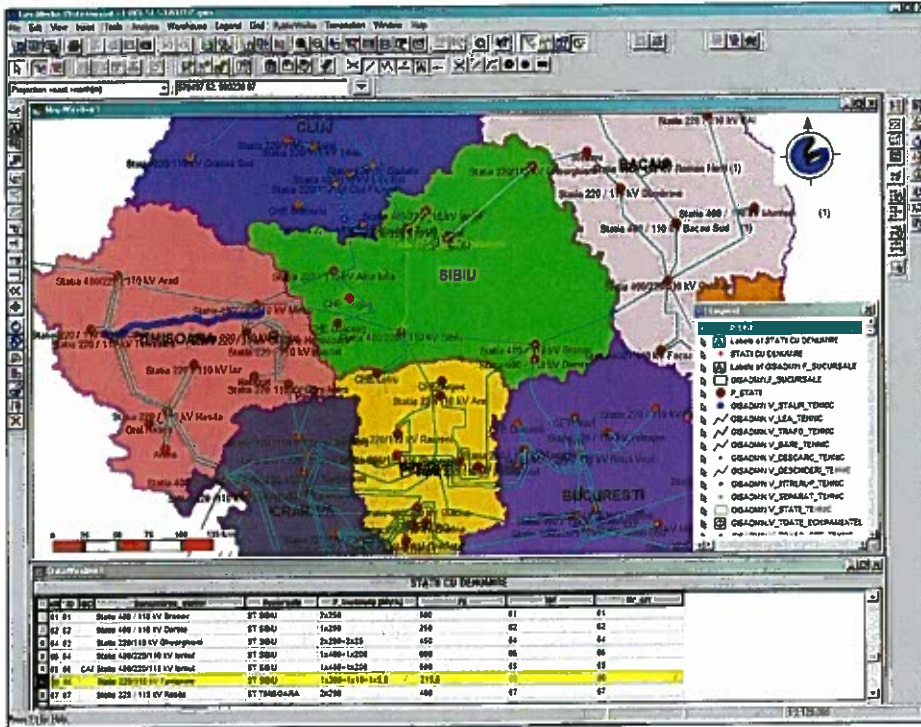
GEOSPATIAL TECHNOLOGY FOR ELECTRIC UTILITIES

ELECTRIC UTILITY BUSINESSES TURN TO GEOSPATIALLY POWERED MANAGEMENT PROCESSES TO MAXIMIZE RETURN ON INVESTMENT

Asset-intensive businesses, such as electric utilities, have large capital investments in their extensive and complex transmission and distribution systems. To maximize the return on this investment, electric utilities have begun to geospatially enable their information systems for infrastructure management. Electric utility businesses are finding manual and partially automated systems obsolete: laborious, error-prone and prohibitively slow. Utilities require a geospatially powered network asset database that eliminates redundant or duplicate asset management processes – one that refines workflows spanning the entire electric utility infrastructure. This new paradigm for dealing with expansive infrastructures also includes the need for automating field work processes, as the majority of the electric utility workforce is field-based and involved in the planning, design, construction, maintenance or operation of these geographically dispersed transmission and distribution assets.

Challenges to the Industry

Faced with an increasingly dynamic operating environment, electric utilities of all sizes must now view change as the only constant. In the coming age of intelligent or “smart” grids, distribution infrastructures will shift rapidly toward self-operation and auto-healing. Utilities will also face the accelerating challenge of being good stewards of the environment, while meeting the energy needs of their customers. They must do more with less. In the next 10 to 15 years, consumers around the world will see major changes in the way electricity is transmitted, distributed and metered. To effectively harness and manage this change, electric utilities need sophisticated software



Screenshot from the Transelectrica geo-based information system

solutions and visionary partners who are up to the challenge – partners who provide cost-effective, enterprise-scalable solutions based on proven best practices.

The Big Picture for Integrated Solutions

Enterprise integration requires that a superior infrastructure management solution integrate well with other systems within the corporation that require location-based asset information, including:

- Customer information systems
- Work management systems
- Enterprise resource management systems
- Financial systems
- Outage management systems

Romanian power system operator response

Transelectrica SA (www.transelectrica.ro) strives to provide transmission, system, market and metering services to all of its grid customers in the Romanian electricity market. Transelectrica also secures power generation dispatching and provides real-time control of the power system, while planning and developing the transmission grid. Managing eight electricity transmission branches in key Romanian cities and 8,800 km of overhead electric lines, Transelectrica must ensure the safe and cost-efficient operation of the Romanian power system.

Previously, Transelectrica's organizational structure consisted of what was essentially a paper-based system for information exchange. Its applications lacked coherency, and only one branch was using geographic information system (GIS) technology. The central office and remaining branches were not equipped for GIS. Transelectrica wanted to

implement a solution that would provide a true enterprise geospatial system, one creating a central information repository and eliminating problems such as dual reporting. Consolidating the disparate data would improve Transelectrica's viability and the reliability of the power system, significantly increase operator effectiveness and allow the interconnection with West European power networks.

The project objectives were to:

- support technical department operations, integrating all functional processes,
- consolidate technical information into a centralized database, and
- improve the decision-making process.

When Transelectrica started the automation process, the company's top priority was to become internationally competitive. It planned to accomplish this goal through massive cost reductions, while meeting Union for the Coordination of Transmission of Electricity (UCTE) standards. The company's management team knew the goals could not be achieved without effective technical management of the entire power network. Efficient management of geospatial data would allow all users fast and real control of power lines and 76 stations.

Three areas of the company were identified as crucial to improving the delivery and efficiency of information: Power Grid Division, Patrimony Service/Office and Plan Marketing Division. The main requirement of the project was database software based on a centralized system. The software would allow the database to be installed in the company's headquarters, with users at each branch able to access and manage information. The

software also had to be in accordance with the selected architecture of Transelectrica, a centralized system for data storage and distributed for data access.

Transelectrica established strict guidelines for features required in the geospatial system. The company implemented a solution based on GeoMedia from Intergraph and Oracle technology. The Intergraph technology provided the standard GIS functionality, including visualization and editing tools, mapping and plotting, query and analysis and versioning and export facilities. Specific business functions such as network tracing and network analysis were developed on top of GeoMedia's open platform.

The resulting system has provided all Transelectrica users with immediate access to accurate information. The streamlining of data enables the efficient execution of complex operations and allows for faster and more accurate analysis. Now, Transelectrica can store, archive and access more information, facilitating operational control, planning and procedures. Theme maps also make it easier to visualize complex data.

Key benefits achieved include:

- providing significant support to decision process management (faster and better decisions),
- time savings and increased efficiency in supplying and analyzing information,
- automation of repetitive complex operations,
- easy user access to information, and
- the ability to store, archive and access extensive amounts of information.

In the future, Transelectrica plans to develop a mobile GIS solution for data collection and entry into the system directly from the field through PDA devices. The utility wants to extend its standards to meet those of suppliers, creating interoperability. Additional future plans include integrating the database with metering tools for in-depth analysis and diagnosis, and integrating the visual GIS features with EMS/SCADA systems. Adrian Baicusi, general manager at Transelectrica, notes that users are key to making the system work properly. Quality and integrity of data are also vital for the system to function properly. "If you have no GIS system, conceive an integrated one from the beginning and make it open," Baicusi says. "You will spend thousands today, but save millions tomorrow."

Transelectrica SA provides power transmission services to all its licensed clients acting on the Romanian Electricity Market by operating, maintaining, and further developing the national high voltage transmission network while preserving the operational stability and safety of the Romanian Electricity System.

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